

**Amendments to the Claims:**

1. (original) A method, comprising:  
designing a TEQ (Time Equalizer) in a DMT (Discrete Multi-Tone) system to improve throughput performance; and  
reducing the number and severity of notches that the TEQ introduces in a transfer function of a shortened main channel in the DMT system.
2. (original) The method of claim 1, wherein designing the TEQ comprises  
selecting an eigenvector with a subspace-based design method; and  
computing TEQ filter coefficients with the eigenvector.
3. (original) The method of claim 2, wherein designing the TEQ further comprises using a MSSNR (Maximum Shortening Signal-to-Noise Ratio) method.
4. (original) The method of claim 2, wherein designing the TEQ further comprises using a MinISI (Minimum Inter-Symbol Interference) method.
5. (original) The method of claim 2, wherein the eigenvector used to compute the TEQ filter coefficients does not correspond to a maximum eigenvalue.
6. (original) The method of claim 2, wherein selecting the eigenvector comprises maximizing the achievable bitrate over a subspace of eigenvectors.
7. (original) The method of claim 6, wherein the subspace of eigenvectors has a basis of eigenvectors corresponding to a set of eigenvalues that are comparable in magnitude to a maximum eigenvalue.
8. (original) The method of claim 1, wherein the TEQ design is used in a multiline communications system having multiple twisted copper pairs as a single multiline

communications channel, and physical-layer signals coordinated across multiple transmitters and/or across multiple receivers for the purpose of minimizing interference noise from external sources, such as crosstalk noise from other high-bitrate services operating in a common binder or adjacent binders.

9. (original) The method of claim 8, wherein designing the TEQ comprises selecting an eigenvector with a subspace-based design method; and computing TEQ filter coefficients with the eigenvector.

10. (original) The method of claim 8, wherein designing the TEQ further comprises using a MSSNR (Maximum Shortening Signal-to-Noise Ratio) method.

11. (original) The method of claim 8, wherein designing the TEQ further comprises using a MinISI (Minium Inter-Symbol Interference) method.

12. (original) The method of claim 8, wherein the eigenvector used to compute the TEQ filter coefficients does not correspond to a maximum eigenvalue.

13. (original) The method of claim 8, wherein selecting the eigenvector comprises maximizing the achievable bitrate over a subspace of eigenvectors.

14. (original) The method of claim 13, wherein the subspace of eigenvectors has a basis of eigenvectors corresponding to a set of eigenvalues that are comparable in magnitude to a maximum eigenvalue.

15. (original) A system, comprising:  
means for designing a TEQ (Time Equalizer) in a DMT (Discrete Multi-Tone) system to improve throughput performance; and

means for reducing the number and severity of notches that the TEQ introduces in a transfer function of a shortened main channel in the DMT system.

16. (original) The system of claim 15, wherein the means for designing the TEQ comprises means for selecting an eigenvector with a subspace-based design system; and means for computing TEQ filter coefficients with the eigenvector.

17. (original) The system of claim 16, wherein the means for designing the TEQ further comprises means for using a MSSNR (Maximum Shortening Signal-to-Noise Ratio) system.

18. (original) The system of claim 16, wherein means for designing the TEQ further comprises means for using a MinISI (Minimum Inter-Symbol Interference) system.

19. (original) The system of claim 16, wherein the eigenvector used to compute the TEQ filter coefficients does not correspond to a maximum eigenvalue.

20. (original) The system of claim 16, wherein means for selecting the eigenvector comprises means for maximizing the achievable bitrate over a subspace of eigenvectors.

21. (original) The system of claim 20, wherein the subspace of eigenvectors has a basis of eigenvectors corresponding to a set of eigenvalues that are comparable in magnitude to a maximum eigenvalue.

22. (original) The system of claim 15, wherein the TEQ design is used in a multiline communications system having multiple twisted copper pairs as a single multiline communications channel, and physical-layer signals coordinated across multiple transmitters and/or across multiple receivers for the purpose of minimizing interference noise from external sources, such as crosstalk noise from other high-bitrate services operating in a common binder or adjacent binders.

23. (original) The system of claim 20, wherein means for designing the TEQ comprises  
means for selecting an eigenvector with a subspace-based design system; and  
means for computing TEQ filter coefficients with the eigenvector.
24. (original) The system of claim 22, wherein designing the TEQ further comprises means for  
using a MSSNR (Maximum Shortening Signal-to-Noise Ratio) system.
25. (original) The system of claim 22, wherein means for designing the TEQ further comprises  
means for using a MinISI (Minimum Inter-Symbol Interference) system.
26. (original) The system of claim 22, wherein the eigenvector used to compute the TEQ filter  
coefficients does not correspond to a maximum eigenvalue.
27. (original) The system of claim 22 wherein means for selecting the eigenvector comprises  
means for maximizing the achievable bitrate over a subspace of eigenvectors.
28. (original) The system of claim 27, wherein the subspace of eigenvectors has a basis of  
eigenvectors corresponding to a set of eigenvalues that are comparable in magnitude to a  
maximum eigenvalue.
29. (original) A computer readable medium, having stored thereon computer-readable  
instructions, which when executed in a computer system, cause the computer system to:  
design a TEQ (Time Equalizer) in a DMT (Discrete Multi-Tone) system to improve  
throughput performance; and  
reduce the number and severity of notches that the TEQ introduces in a transfer function  
of a shortened main channel in the DMT system.

30. (original) The computer readable medium of claim 29, further having stored thereon computer-readable instructions, which when executed in the computer system to design the TEQ, cause the computer system to

select an eigenvector with a subspace-based design computer readable medium; and  
compute TEQ filter coefficients with the eigenvector.

31. (original) The computer readable medium of claim 30, further having stored thereon computer-readable instructions, which when executed in the computer system to design the TEQ, cause the computer system to use a MSSNR (Maximum Shortening Signal-to-Noise Ratio) computer readable medium.

32. (original) The computer readable medium of claim 30, further having stored thereon computer-readable instructions, which when executed in the computer system to design the TEQ, cause the computer system to use a MinISI (Minimum Inter-Symbol Interference) computer readable medium.

33. (original) The computer readable medium of claim 30, wherein the eigenvector used to compute the TEQ filter coefficients does not correspond to a maximum eigenvalue.

34. (original) The computer readable medium of claim 30, further having stored thereon computer-readable instructions, which when executed in the computer system to select the eigenvector, cause the computer system to maximize the achievable bitrate over a subspace of eigenvectors.

35. (original) The computer readable medium of claim 34, wherein the subspace of eigenvectors has a basis of eigenvectors corresponding to a set of eigenvalues that is comparable in magnitude to a maximum eigenvalue.

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36. (original) The computer readable medium of claim 29, wherein the TEQ design is used in a multiline communications system having multiple twisted copper pairs as a single multiline communications channel, and physical-layer signals coordinated across multiple transmitters and/or across multiple receivers for the purpose of minimizing interference noise from external sources, such as crosstalk noise from other high-bitrate services operating in a common binder or adjacent binders.

37. (original) The computer readable medium of claim 36, further having stored thereon computer-readable instructions, which when executed in the computer system to design the TEQ, cause the computer system to

select an eigenvector with a subspace-based design computer readable medium; and  
compute TEQ filter coefficients with the eigenvector.

38. (original) The computer readable medium of claim 36, further having stored thereon computer-readable instructions, which when executed in the computer system to design the TEQ, cause the computer system to use a MSSNR (Maximum Shortening Signal-to-Noise Ratio) computer readable medium.

39. (original) The computer readable medium of claim 36, further having stored thereon computer-readable instructions, which when executed in the computer system to design the TEQ, cause the computer system to use a MinISI (Minimum Inter-Symbol Interference) computer readable medium.

40. (original) The computer readable medium of claim 36, wherein the eigenvector used to compute the TEQ filter coefficients does not correspond to a maximum eigenvalue.

41. (original) The computer readable medium of claim 36, further having stored thereon computer-readable instructions, which when executed in the computer system to select the

eigenvector, cause the computer system to maximize the achievable bitrate over a subspace of eigenvectors.

42. (original) The computer readable medium of claim 41, wherein the subspace of eigenvectors has a basis of eigenvectors corresponding to a set of eigenvalues that are comparable in magnitude to a maximum eigenvalue.

43.(new) A method of processing a received DMT symbol that is preceded by a prefix and does not include a suffix, the method comprising:

- extracting a last portion of a prefix symbol;
- shaping a prefix with a prefix window to create a shaped prefix;
- shaping a DMT symbol that does not include a suffix with a DMT window to create a shaped DMT symbol; and
- combining the shaped DMT symbol and the shaped prefix.

44.(new) A method of processing a received DMT symbol that has not been windowed for transmission, the method comprising:

- extracting a last portion of a prefix symbol;
- shaping a prefix with a prefix window to create a shaped prefix;
- shaping a DMT symbol that has not been windowed for transmission with a DMT window to create a shaped DMT symbol; and
- combining the shaped DMT symbol and the shaped prefix.